Figure 1, Messenger Interconnected Processor Array
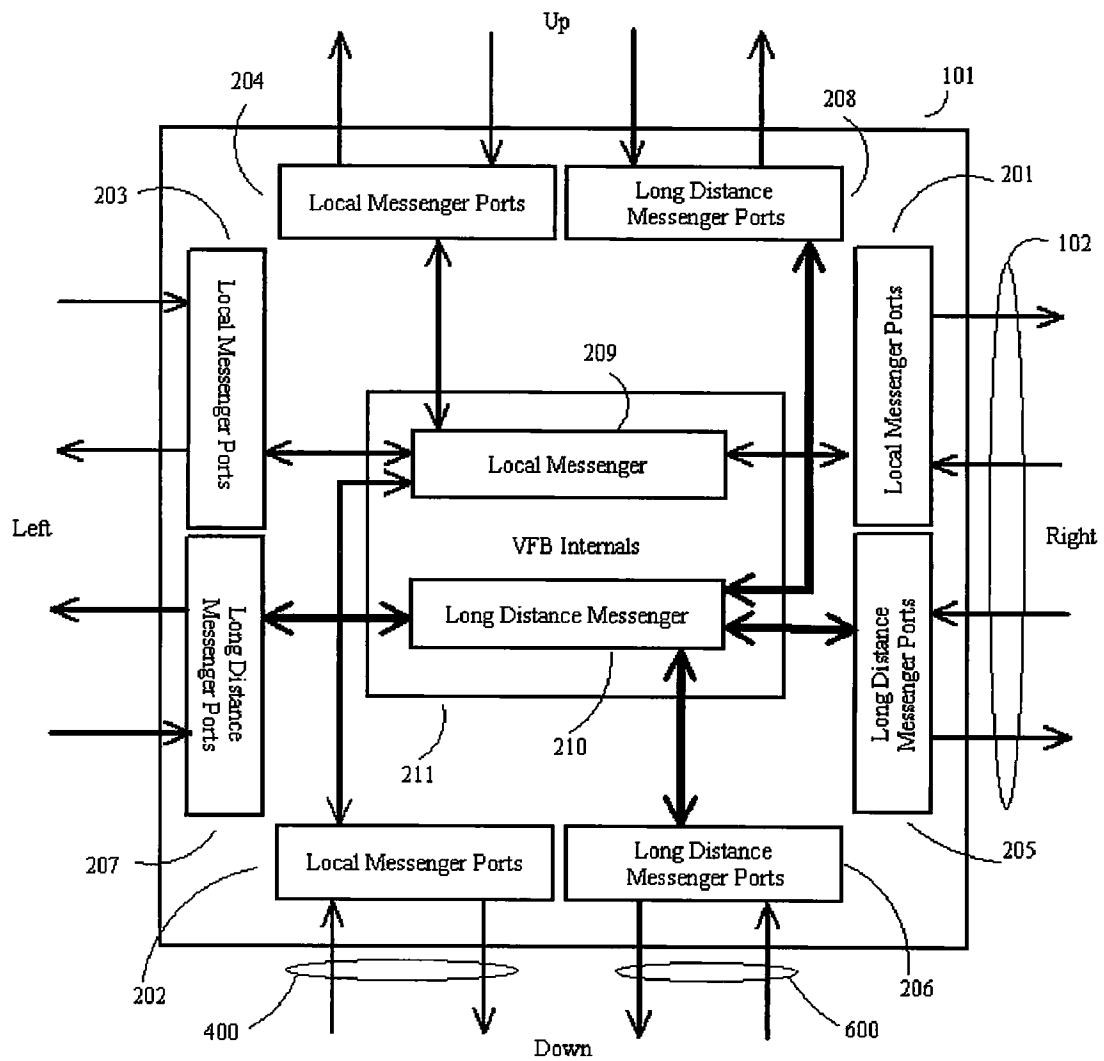
Figure 2, Individual VFB
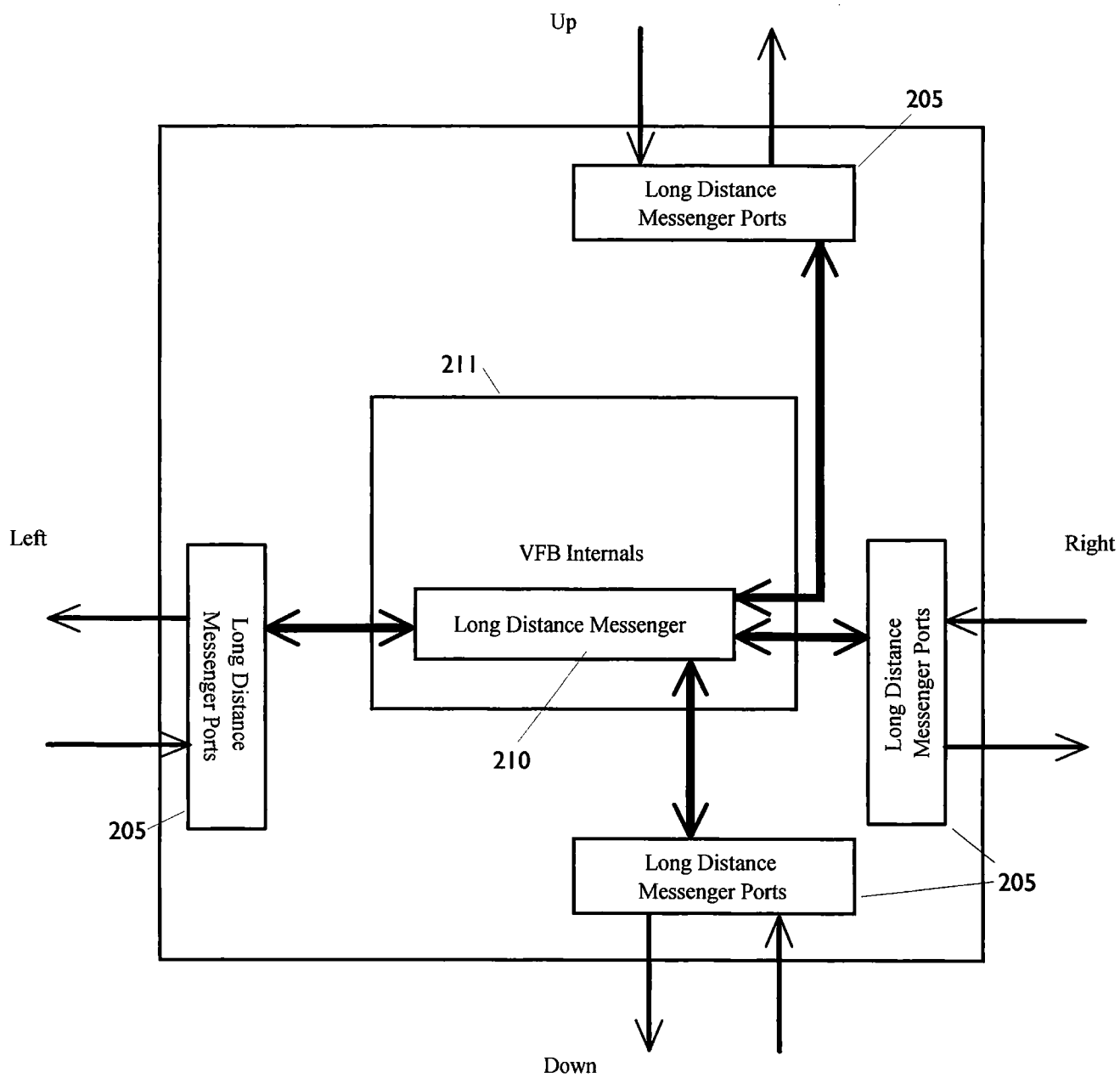
Figure 2A, Individual VFB
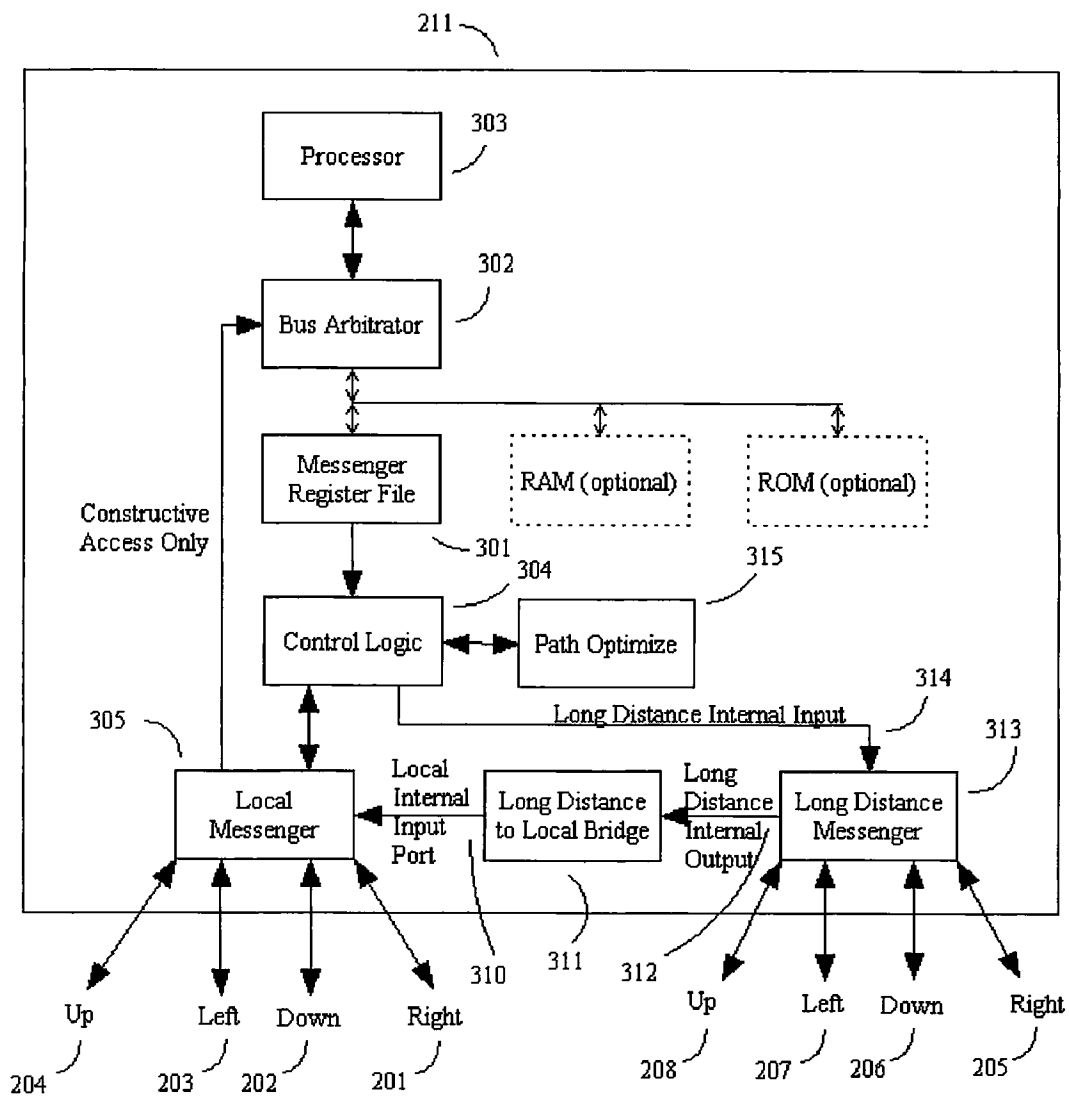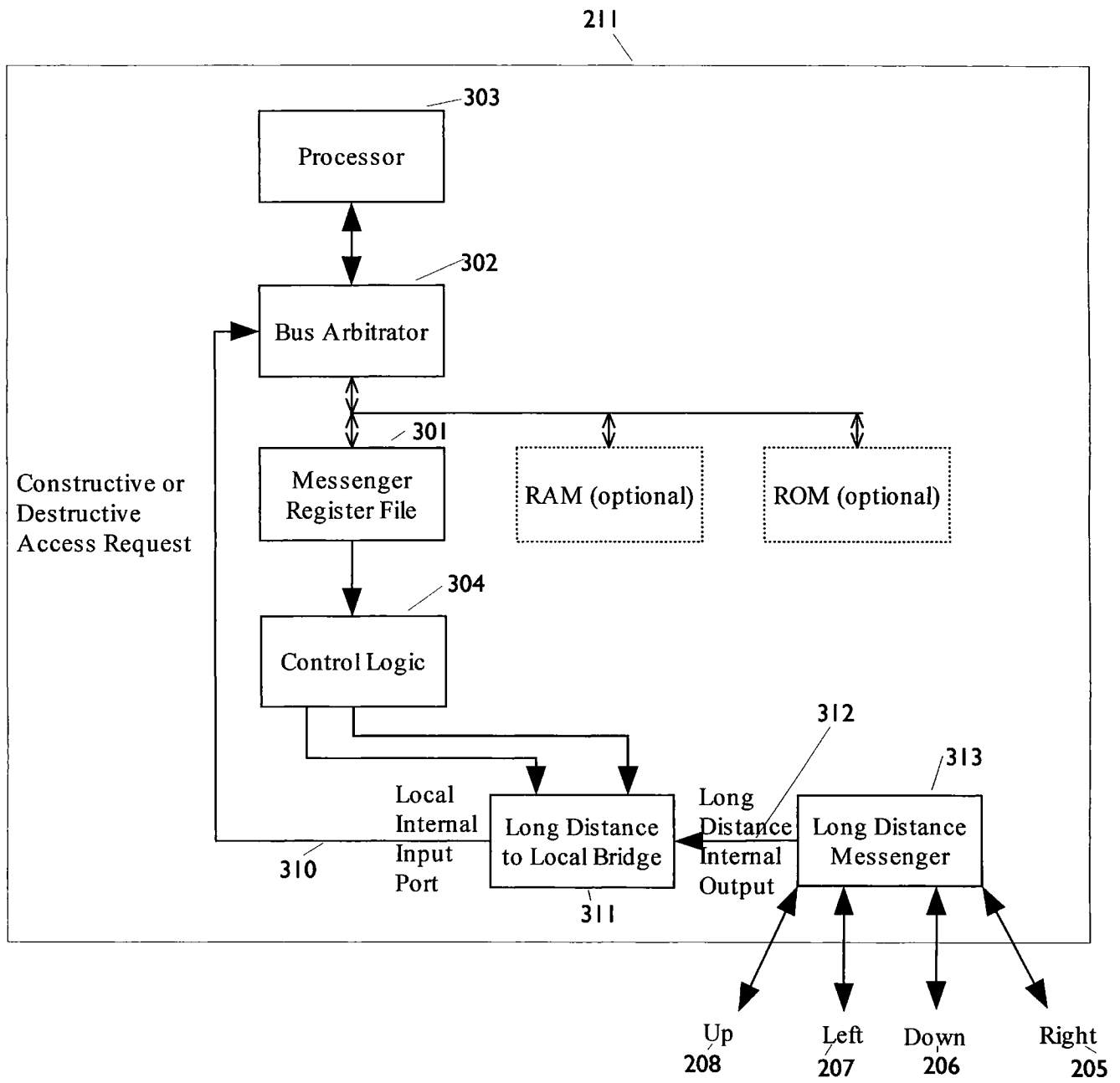
Figure 3, VFB Internals

211

303

Processor

302

Bus Arbitrator

Constructive or
Destructive
Access Request

301

Messenger
Register File

RAM (optional)

ROM (optional)

304

Control Logic

Local
Internal
Input
Port

310

Long Distance
to Local Bridge

311

Long
Distance
Internal
Output

312

313

Long Distance
Messenger

Up
208

Left
207

Down
206

Right
205

Figure 3A, VFB Internals

Connected to
Local Messenger
Within VFB

400

401

Local
Messenger
Input Port

402

Local
Messenger
Output Port

Req
Force
Interrupt
Register Index
Data
Presence
Ack

Req
Force
Interrupt
Register Index
Data
Presence
Ack

Connected to
Adjacent VFBs

Figure 4, Local Messenger Port
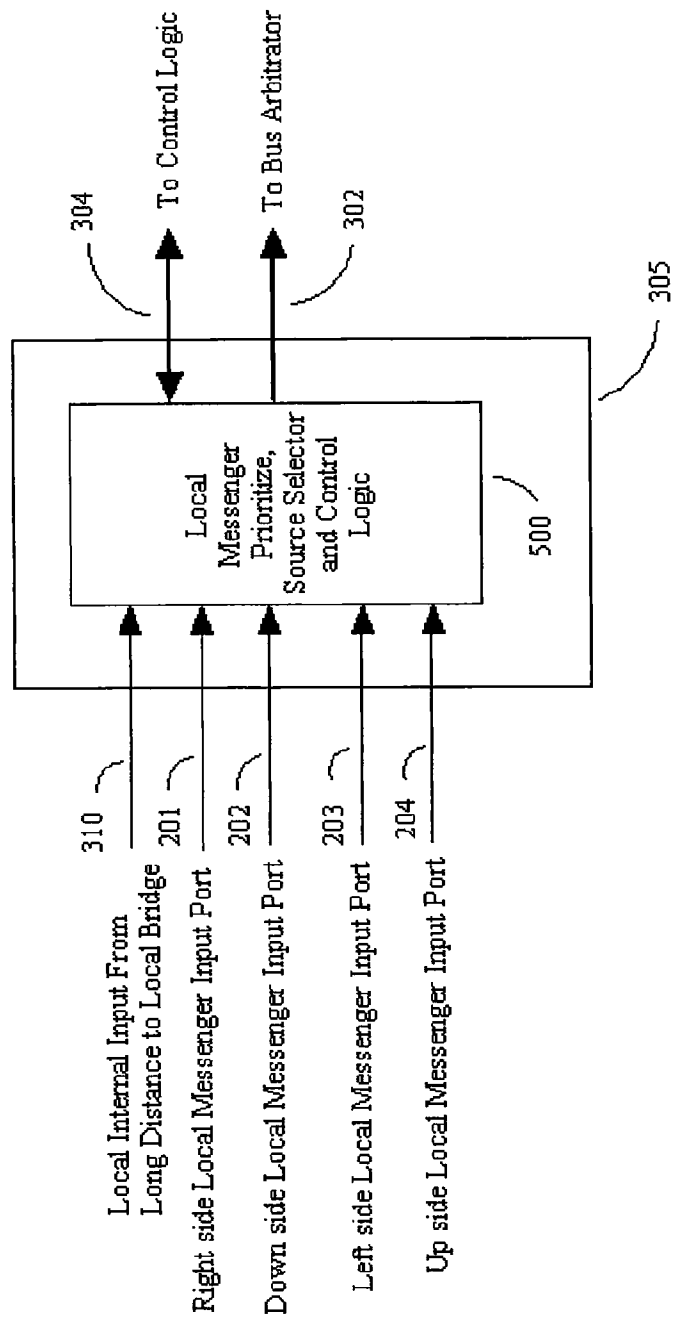
Figure 5, Local Messenger

Local Internal Input From
Long Distance to Local Bridge   310

Right side Local Messenger Input Port   201

Down side Local Messenger Input Port   202

Left side Local Messenger Input Port   203

Up side Local Messenger Input Port   204

Local
Messenger
Prioritize,
Source Selector
and Control
Logic   500

To Control Logic   304

To Bus Arbitrator   302

305
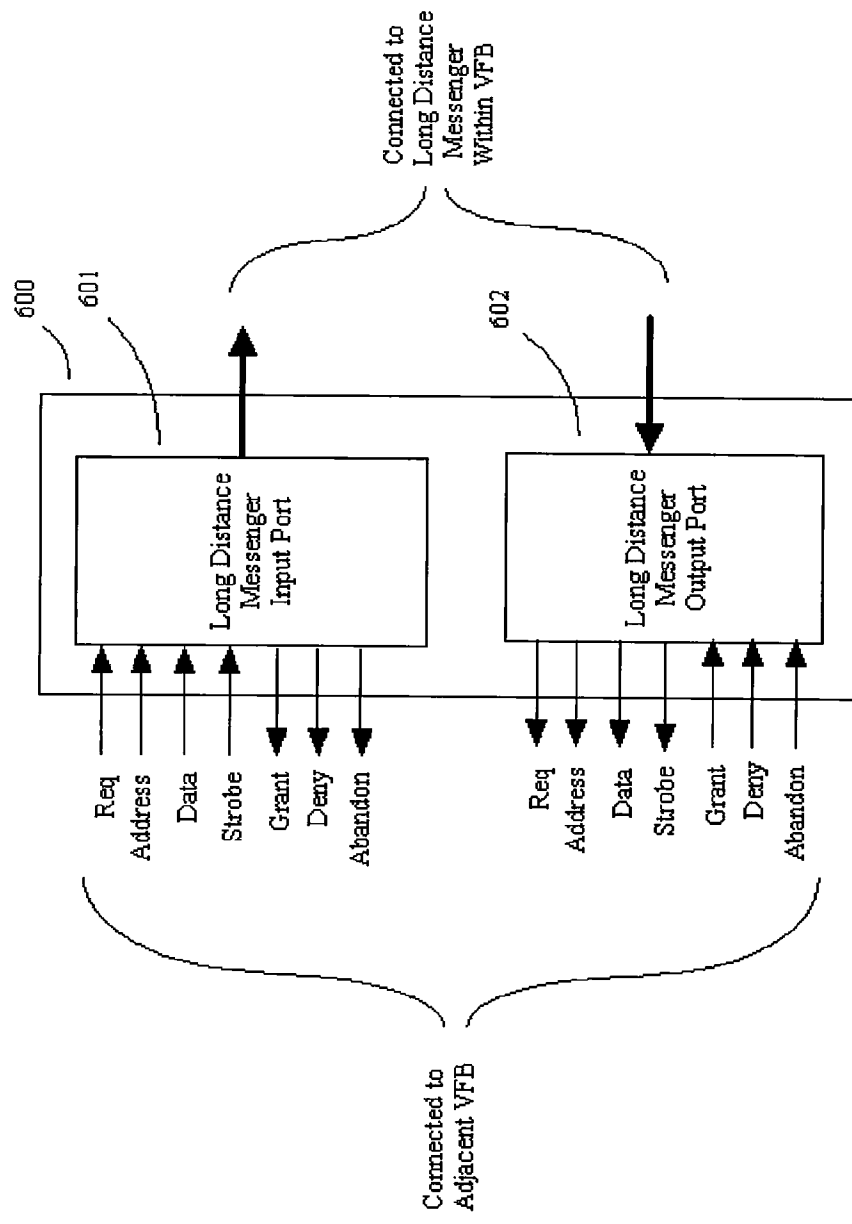
Figure 6, Long Distance Messenger Port

603

Set on Row=0   Set on Row Busy

704

703

701

Long
Distance
Input
Port
Address

Busy Signal
Generated
By Each
Output Port

Input
Port For
This
Direction

Address
Inspection

Row Inhibit

Direction
Selection

Request
to Each
Port
Choice

Column Inhibit

Req

702

Set on Column=0   Set on Column Busy

Deny

All Port Lines
Except Req and Deny

To Port
Selection
Interconnections

806   750   604

Requests
From All
Other
Directions

Request Resolver
and Multiplexor
Control

Req

Deny

Busy
To All
Other
Directions

Output Port
For This
Direction

Winning
Request
Source

Port
Selection
Interconnections

Multiplexor and
Address Decrease

All Port Lines
Except
Req and Deny

808

751

Figure 7, Long Distance Messenger Port Control Logic
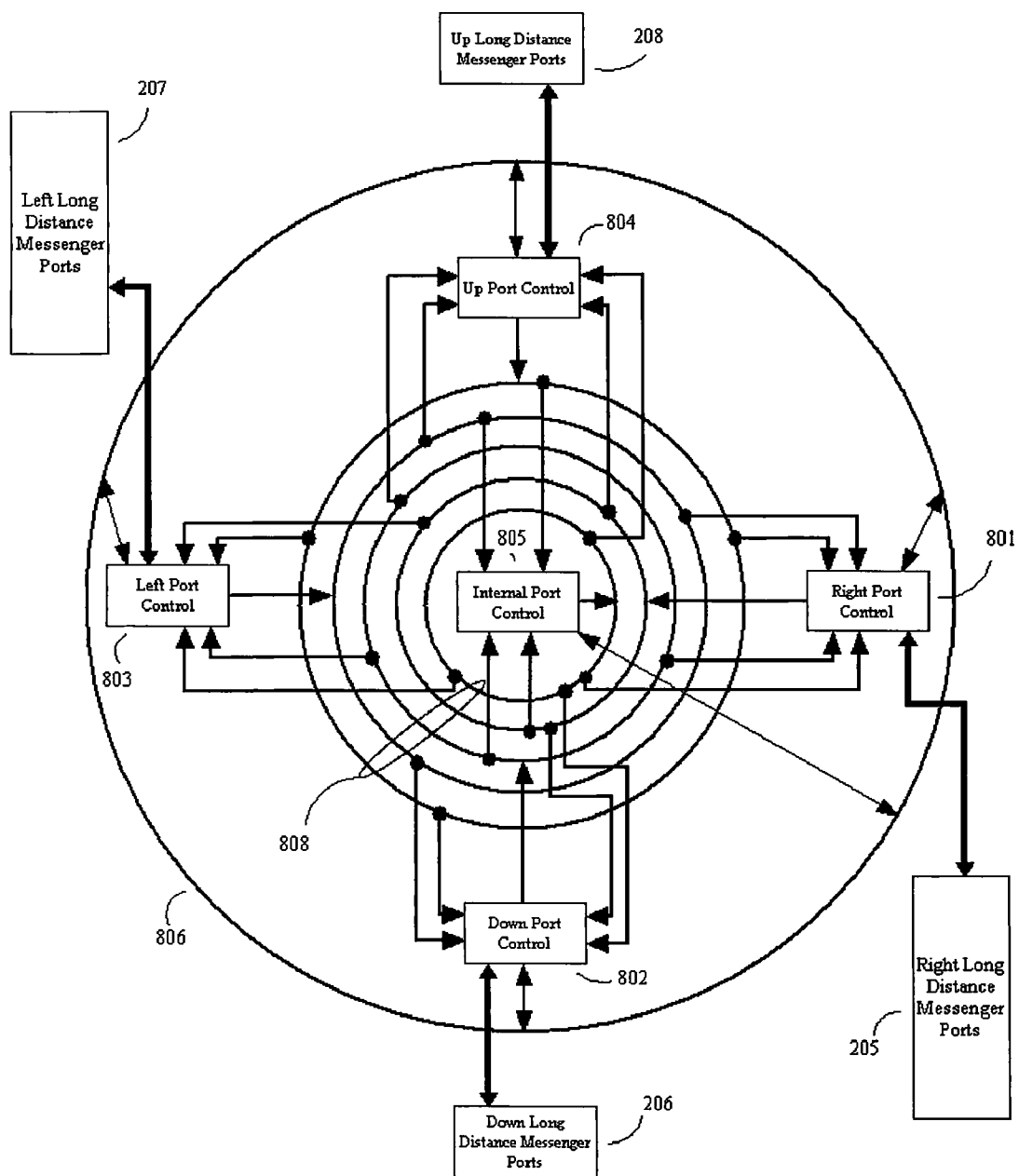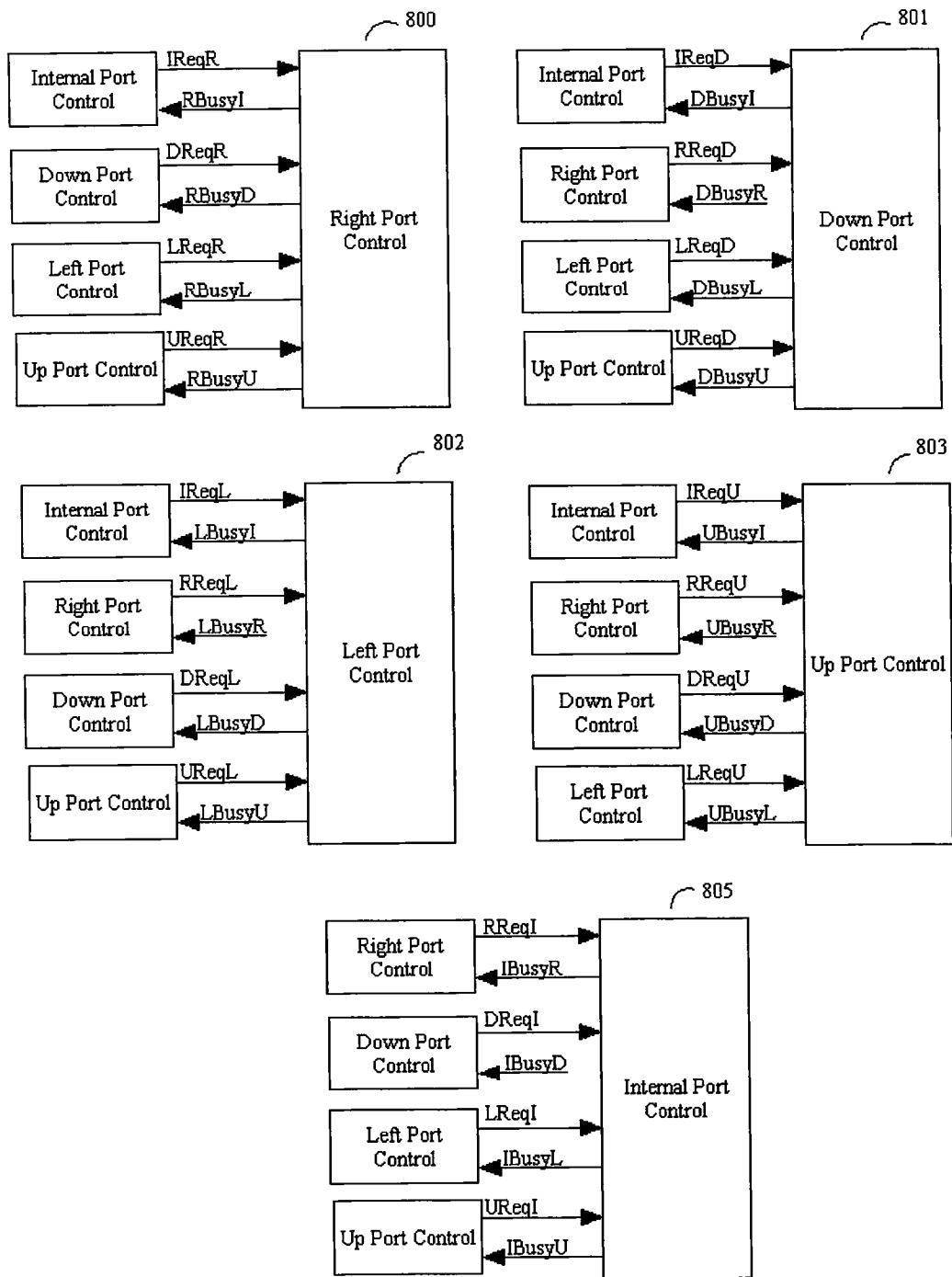
Figure 8, Long Distance Messenger

Figure 9, Request and Busy Information Shared Among Long Distance Port Controls
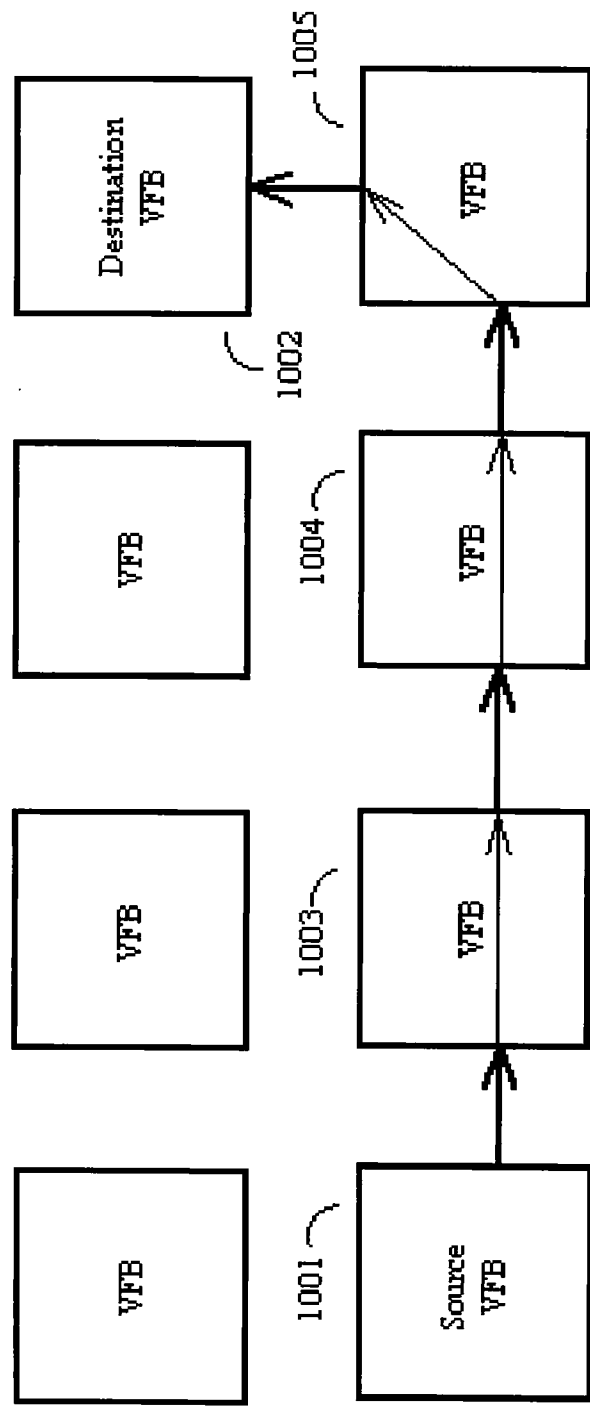
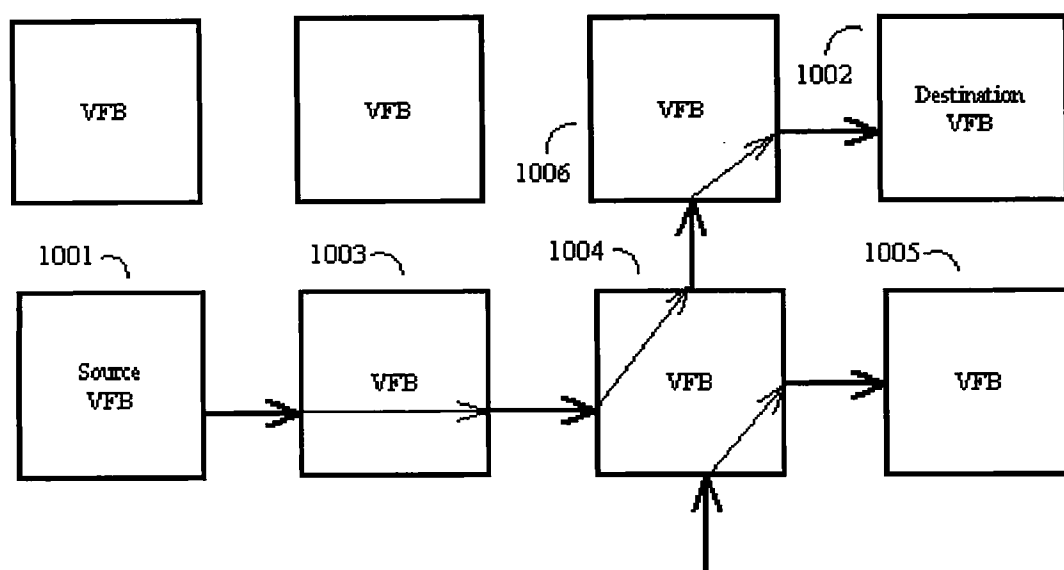Figure 10, A Long Distance Message Connection, No Path Contention

Figure 11, A Long Distance Message Connection, Path Contention Without Deny
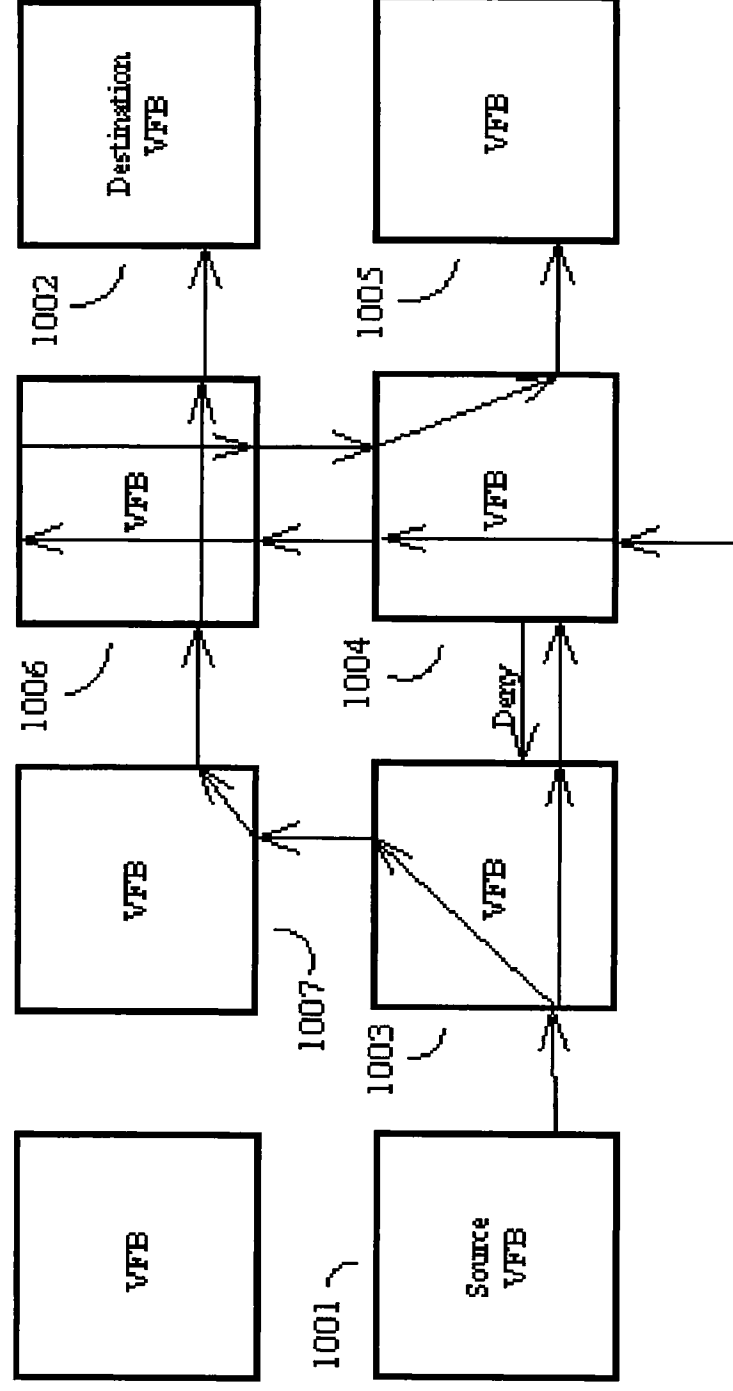
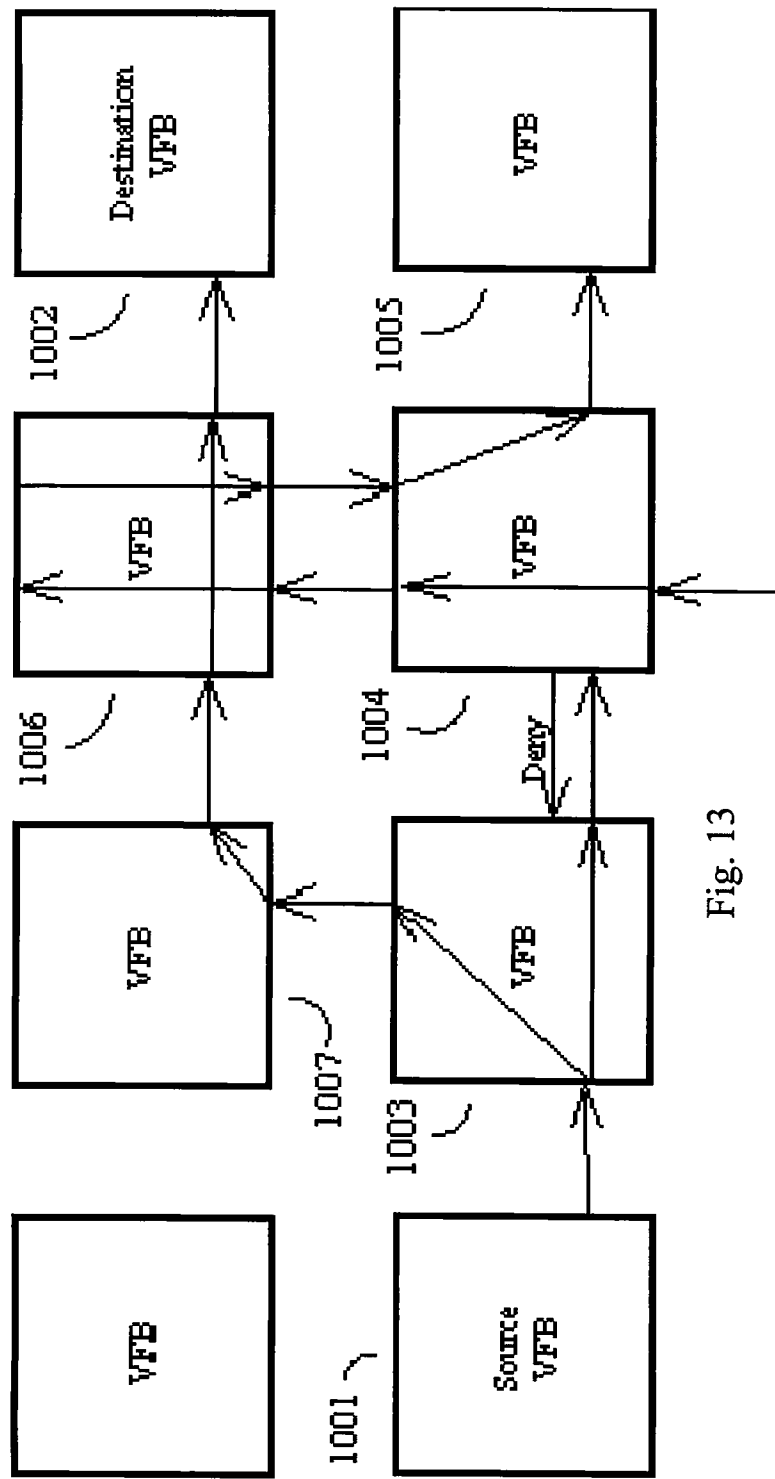Figure 12, A Long Distance Message Connection, Path Contention With Deny

Fig. 13

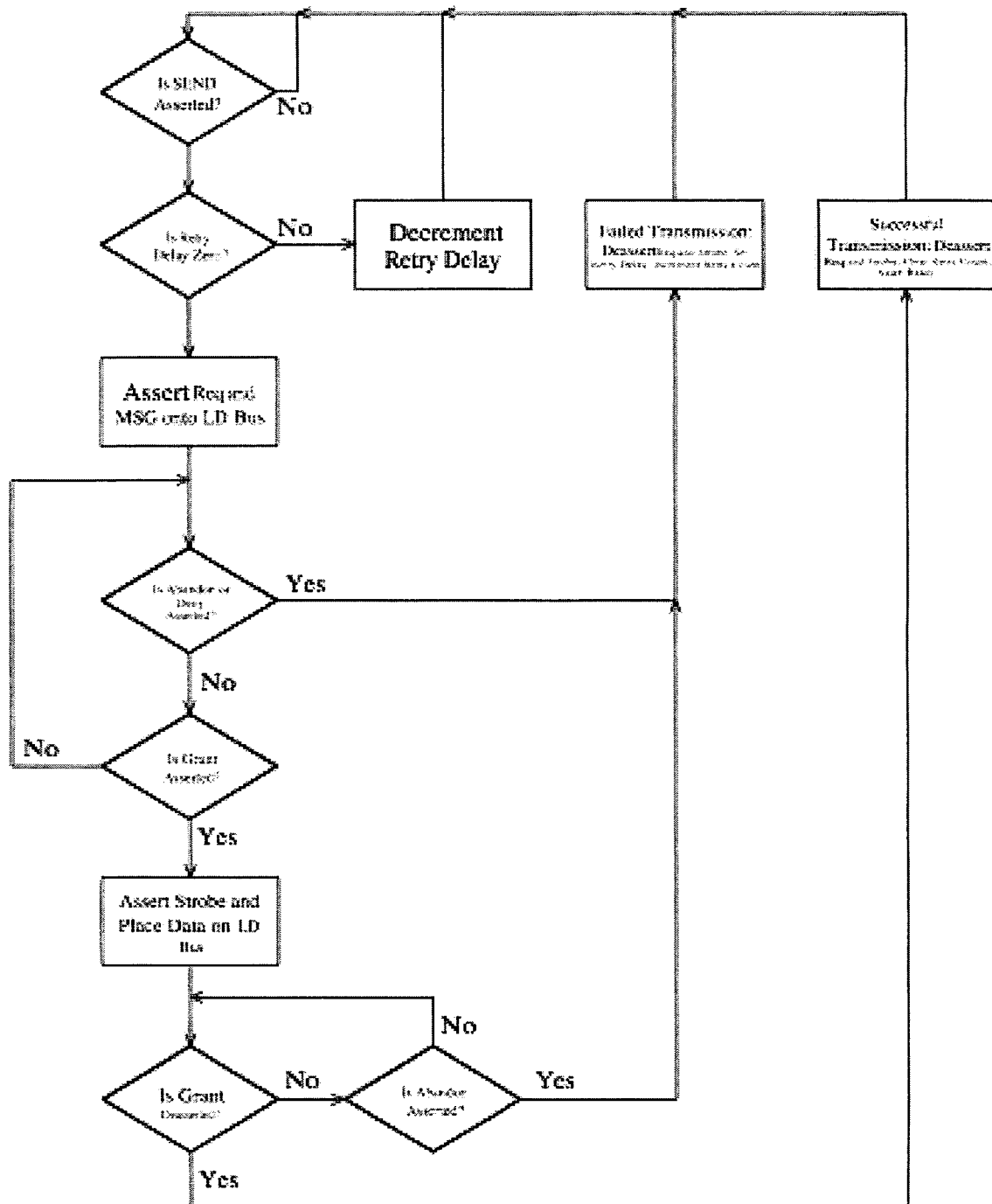## Fig. 14 Bridge Send Operation (Single Port, Optimistic Send)

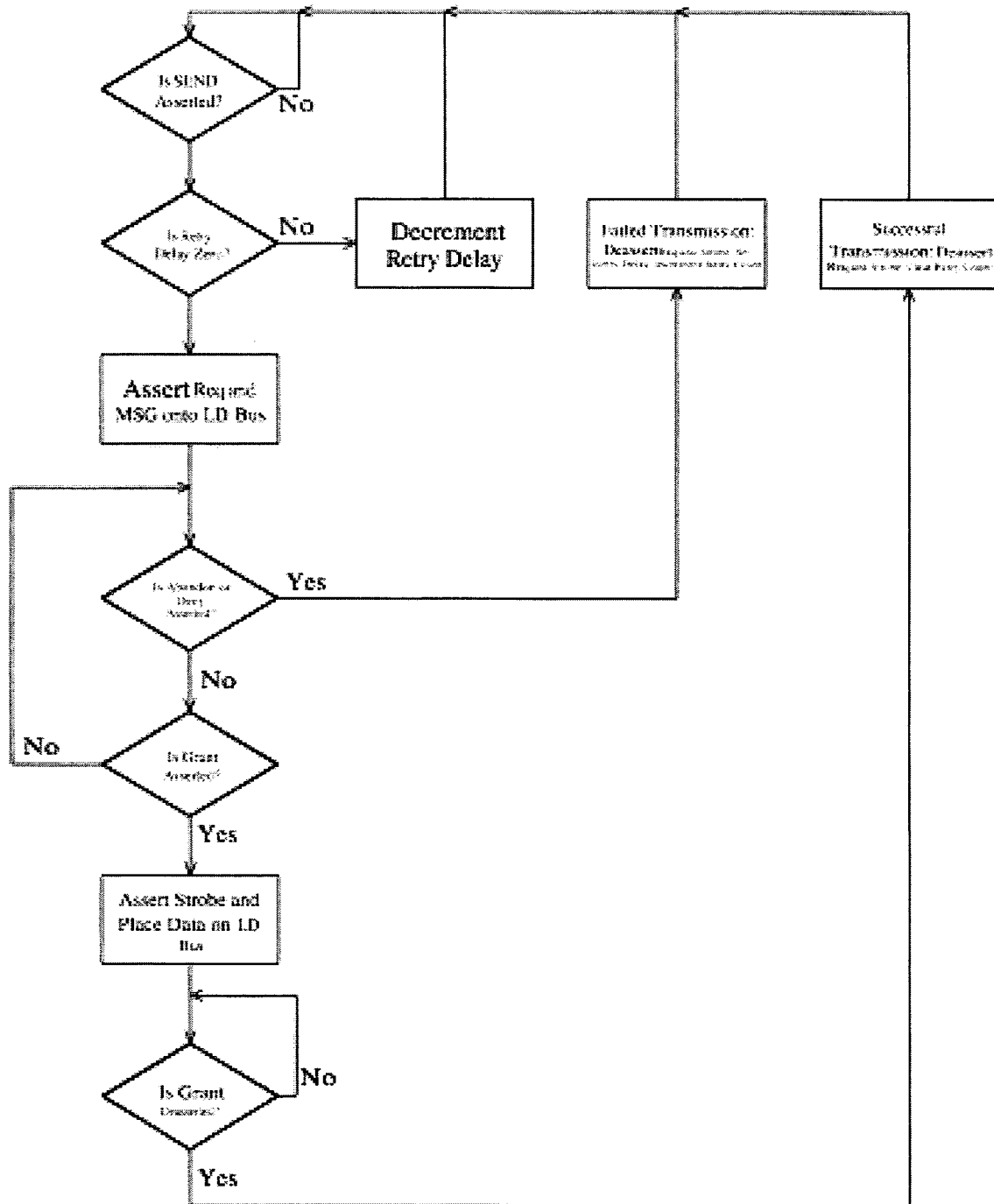Fig. 15   Bridge Send Operation (Single Port, Pessimistic Send)

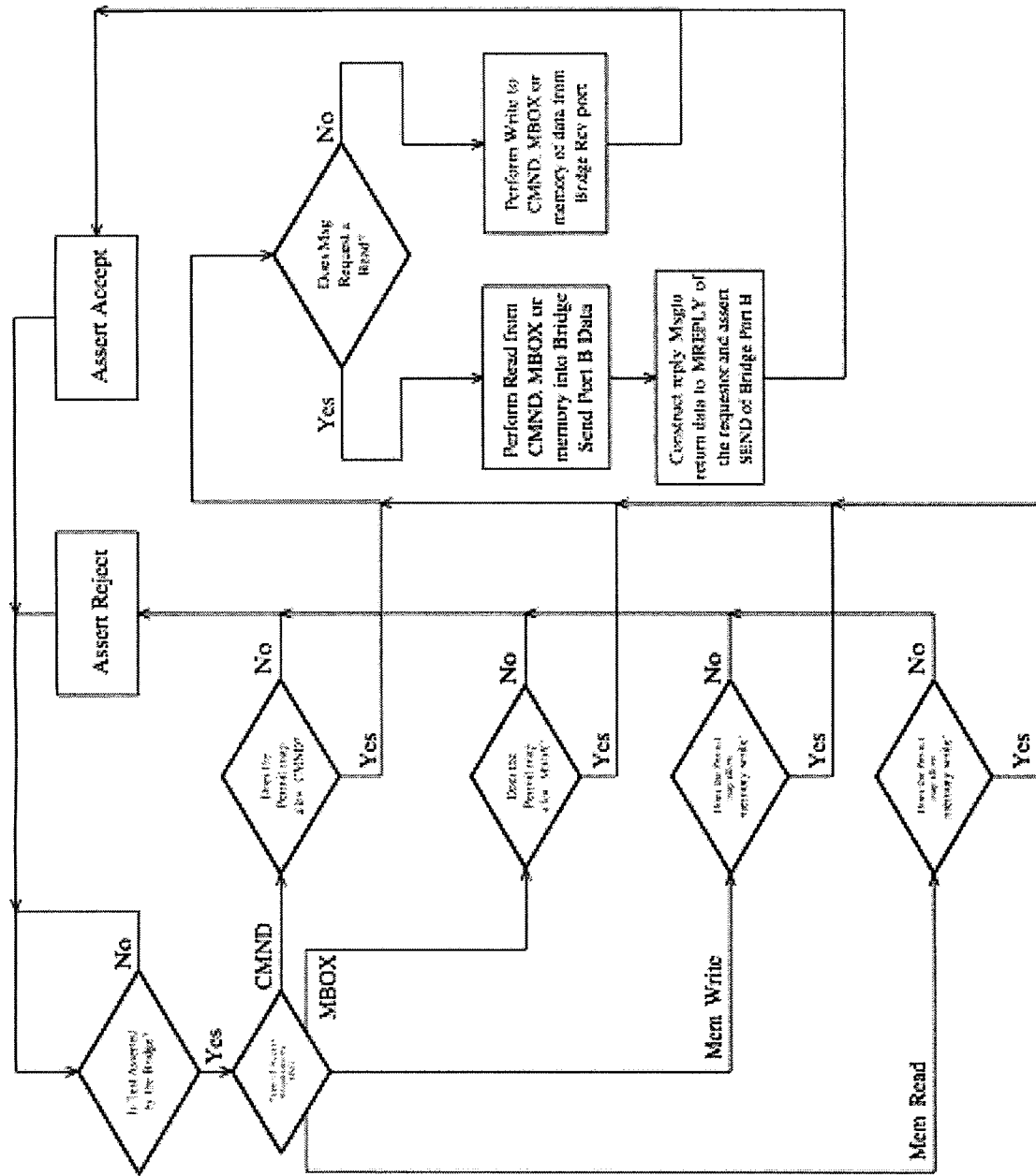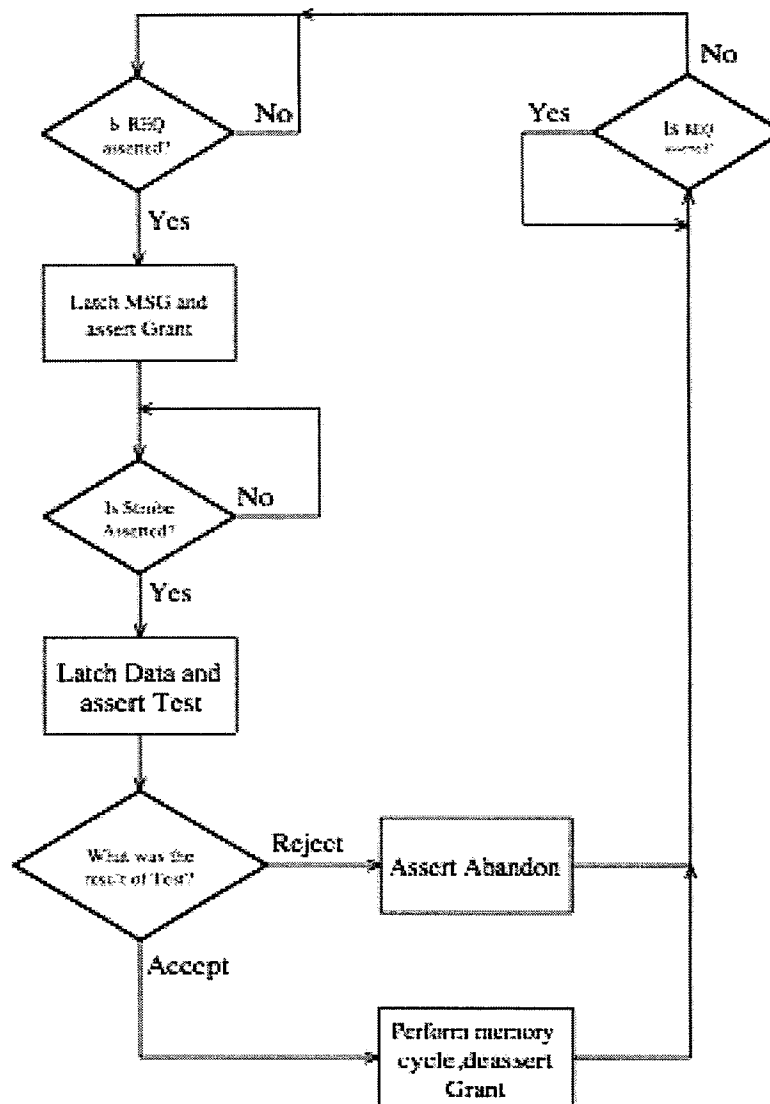Fig. 16   Permissions Test (Dual Send Port Bridge)

Fig. 17   Bridge Receive (Optimistic)

Fig. 18   Bridge Receive (Pessimistic)